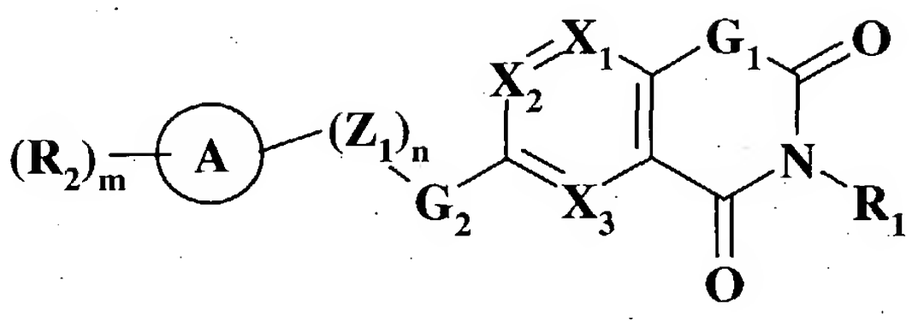
CLAIMS

What is claimed is:

1- A compound of formula (I):



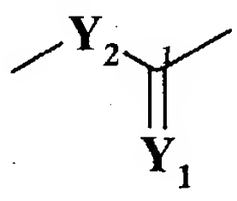
(I)

wherein:

- X_1, X_2, and X_3, independently of each other, represent a nitrogen atom or a group $-CR_3$ in which R_3 represents a group selected from hydrogen, $(C_1\text{-}C_6)$alkyl, amino, mono$(C_1\text{-}C_6)$alkylamino, di$(C_1\text{-}C_6)$alkylamino, hydroxy, $(C_1\text{-}C_6)$alkoxy, and halogen, it being understood that not more than two of the groups X_1, X_2 and X_3 simultaneously represent a nitrogen atom,

- G_1 represents an oxygen atom or a group $S(O)_p$ in which p represents an integer from 0 to 2 inclusive,

- G_2 represents a group selected from carbon-carbon triple bond, C=O, C=S, $S(O)_q$ in which q represents an integer from 0 to 2 inclusive, or a group of formula (i/a):



(i/a)

in which the carbon atom with the number 1 is attached to the bicycle of the compound of formula (I), Y_1 represents a group selected from oxygen, sulphur, -NH and $-N(C_1\text{-}C_6)$alkyl, and Y_2 represents a group selected from oxygen, sulphur, -NH and $-N(C_1\text{-}C_6)$alkyl,

- n represents an integer from 0 to 6 inclusive,

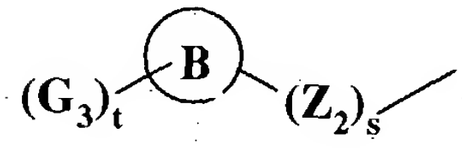
- Z_1 represents $-CR_4R_5$, wherein R_4 and R_5, identical or different independently of each other, represent a group selected from hydrogen, $(C_1\text{-}C_6)$alkyl, trihalogeno$(C_1\text{-}C_6)$alkyl, halogen, amino, mono$(C_1\text{-}C_6)$alkylamino, di$(C_1\text{-}C_6)$alkylamino in which each alkyl moiety

is identical or different, -OR_6, -SR_6, and -C(=O)OR_6, in which R_6 is hydrogen atom or (C_1-C_6)alkyl, and

- wherein when n is greater than or equal to 2, the hydrocarbon chain Z_1 optionally contains one to two isolated or conjugated multiple bonds,
- and/or wherein when n is greater than or equal to 2 one of said –CR_4R_5 may be replaced with a group selected from oxygen, $S(O)_r$ in which r represents an integer from 0 to 2 inclusive, -NH and -N(C_1-C_6)alkyl,

- A represents a group selected from aryl, heteroaryl, cycloalkyl, and heterocycloalkyl, these groups being a 5- or 6-membered monocycle, or bicycle itself composed of two 5- or 6-membered monocycles,

- R_1 represents a group selected from :
  - hydrogen,
  - (C_1-C_6)alkyl, (C_2-C_6)alkenyl, (C_2-C_6)alkynyl, these groups may be optionally substituted with one or more groups, which may be identical or different independently of each other, selected from amino, cyano, trihalogeno(C_1-C_6)alkyl, cycloalkyl, -C(=O)NR_7R_8, -C(=O)OR_7, OR_7, and SR_7, in which R_7 and R_8, which may be identical or different independently of each other, represent hydrogen or (C_1-C_6)alkyl,
  - and the group of formula (i/b) :



(i/b)

✓ in which s is an integer from 0 to 8 inclusive,

✓ Z_2 represents –CR_9R_{10} wherein R_9 and R_{10}, identical or different independently of each other, represent a group selected from hydrogen, (C_1-C_6)alkyl, phenyl, trihalogeno(C_1-C_6)alkyl, halogen, amino, OR_6, SR_6 and -C(=O)OR_6 in which R_6 is as defined hereinbefore, and

- wherein when s is greater than or equal to 2, the hydrocarbon chain Z_2 optionally contains one or two isolated or conjugated multiple bonds,

- and/or wherein when p is greater or equal to 2, one of said $-CR_9R_{10}$ may be replaced with a group selected from oxygen, $S(O)_u$ in which u is an integer from 0 to 2 inclusive, -NH, -N(C_1-C_6)alkyl, and carbonyl,

✓ B represents a group selected from aryl, heteroaryl, cycloalkyl, and heterocycloalkyl, these groups being a 5- or 6-membered monocycle, or bicycle itself composed of two 5- or 6-membered monocycles,

✓ t is an integer from 0 to 7 inclusive,

✓ the group(s) G_3, which may be identical or different independently of each other, is (are) selected from (C_1-C_6)alkyl, halogen, CN, NO_2, CF_3, OCF_3, $-(CH_2)_kNR_{11}R_{12}$, $-N(R_{11})C(=O)R_{12}$, $-N(R_{11})C(=O)OR_{12}$, $-N(R_{11})SO_2R_{12}$, $-N(SO_2R_{11})_2$, $-OR_{11}$, $-S(O)_{k1}R_{11}$, $-SO_2-N(R_{11})-(CH_2)_{k2}-NR_{12}R_{13}$, $-(CH_2)_kSO_2NR_{11}R_{12}$, $-X_4(CH_2)_kC(=O)OR_{11}$, $-(CH_2)_kC(=O)OR_{11}$, $-C(=O)O-(CH_2)_{k2}-NR_{11}R_{12}$, $-C(=O)O-(CH_2)_{k2}-C(=O)OR_{14}$, $-X_4(CH_2)_kC(=O)NR_{11}R_{12}$, $-(CH_2)_kC(=O)NR_{11}R_{12}$, $-R_{15}-C(=O)OR_{11}$, $-X_5-R_{16}$, and $-C(=O)-R_{17}-NR_{11}R_{12}$ in which :

- X_4 represents a group selected from oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by a hydrogen or a (C_1-C_6)alkyl group,

- k is an integer from 0 to 3 inclusive,

- k1 is an integer from 0 to 2 inclusive,

- k2 is an integer from 1 to 4 inclusive,

- R_{11}, R_{12} and R_{13}, which may be identical or different independently of each other, are selected from hydrogen and (C_1-C_6)alkyl,

- R_{14} represents a group selected from (C_1-C_6)alkyl, $-R_{17}-NR_{11}R_{12}$, $-R_{17}-NR_{11}-C(=O)-R_{17}-NR_{12}R_{13}$, and $-C(=O)O-R_{17}-NR_{11}R_{12}$ in which R_{17} represents a

linear or branched (C_1-C_6)alkylene group, and R_{11}, R_{12} and R_{13} are as defined hereinbefore,

- R_{15} represents a (C_3-C_6)cycloalkyl group,

- X_5 represents a group selected from a single bond, -CH_2-, oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or (C_1-C_6)alkyl,

- R_{16} represents a group selected from :
  - a 5- or 6-membered monocyclic aryl or heteroaryl, which is optionally substituted by one or more groups, which may be identical or different independently of each other, selected from (C_1-C_6)alkyl, halogen, hydroxy, cyano, tetrazolyl, amino, and -C(=O)OR_7 wherein R_7 represents hydrogen or (C_1-C_6)alkyl,
  - and a 5- or 6-membered monocyclic cycloalkyl or heterocycloalkyl, which is optionally substituted by one or more groups, which may be identical or different independently of each other, selected from (C_1-C_6)alkyl, halogen, hydroxy, oxo, cyano, tetrazolyl, amino, and -C(=O)OR_7 wherein R_7 represents hydrogen or (C_1-C_6)alkyl,

- m is an integer from 0 to 7 inclusive,

- the group(s) R_2, which may be identical or different independently of each other, is (are) selected from (C_1-C_6)alkyl, halogen, -CN, -NO_2, -SCF_3, -CF_3, -OCF_3, -NR_7R_8, -OR_7, -SR_7, -SOR_7, -SO_2R_7, -$(CH_2)_kSO_2NR_7R_8$, -$X_7(CH_2)_kC(=O)OR_7$, -$(CH_2)_kC(=O)OR_7$, -$X_7(CH_2)_kC(=O)NR_7R_8$, -$(CH_2)_kC(=O)NR_7R_8$, and –X_8-R_{18} in which:
  - X_7 represents a group selected from oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or (C_1-C_6)alkyl,
  - k is an integer from 0 to 3 inclusive,

- R_7 and R_8, which may be identical or different independently of each other, are selected from hydrogen and $(C_1$-$C_6)$alkyl,

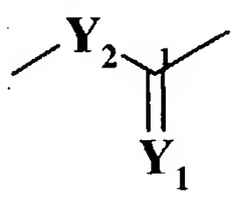
- X_8 represents a group selected from single bond, $-CH_2-$, oxygen, sulphur optionally substituted by one or two oxygen, and nitrogen substituted by hydrogen or $(C_1$-$C_6)$alkyl,

- R_{18} represents a group selected from phenyl, a 5- or 6-membered monocyclic, heteroaryl, and a 5- or 6-membered monocyclic cycloalkyl, each of these groups being optionally substituted by one or more groups, which may be identical or different independently of each other, selected from $(C_1$-$C_6)$alkyl, halogen, hydroxy and amino,

or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof,
wherein the compound of formula (I) is not 6-(2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine)-benzoate, 6-phenylthio-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine, 6-benzylsulphonyl-2,4-dioxo-3,4-dihydro-2H-1.3-benzothiazine, 6-benzophenone-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine or 6-(2,4-dihydroxy)-benzophenone-2,4-dioxo-3,4-dihydro-2H-1,3-benzothiazine.

2- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- G_1 represents a sulphur atom,
- G_2 represents a group of formula (i/a):

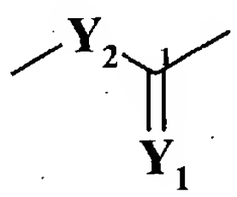


(i/a)

in which the carbon atom with the number 1 is attached to the bicycle of the compound of formula (I), Y_1 represents an oxygen atom, and Y_2 represents a group -NH,
X_1, X_2, X_3, n, Z_1, A, R_1, m and R_2 are as defined in formula (I).

3- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- G_1 represents an oxygen atom,
- G_2 represents a group of formula (i/a):



(i/a)

in which the carbon atom with the number 1 is attached to the bicycle of the compound of formula (I), Y_1 represents an oxygen atom, and Y_2 represents a group -NH,

X_1, X_2, X_3, n, Z_1, A, R_1, m and R_2 are as defined in formula (I).

4- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- G_1 represents a sulphur atom,
- G_2 represents a carbon-carbon triple bond,

n represents an integer from 1 to 6 inclusive,

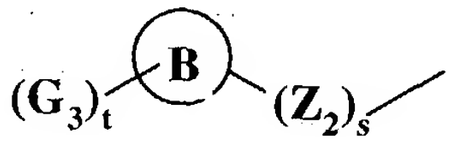
X_1, X_2, X_3, Z_1, A, R_1, m and R_2 are as defined in formula (I).

5- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein :

- G_1 represents an oxygen atom,
- G_2 represents a carbon-carbon triple bond,
- n represents an integer from 1 to 6 inclusive,

X_1, X_2, X_3, Z_1, A, R_1, m and R_2 are as defined in formula (I).

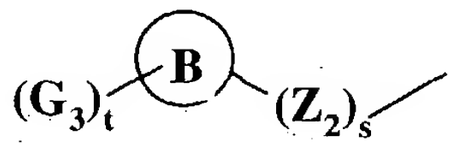
6- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein R_1 represents a group of formula (i/b):



(i/b)

wherein Z_2, s, B, G_3 and t are as defined in the compound of formula (I).

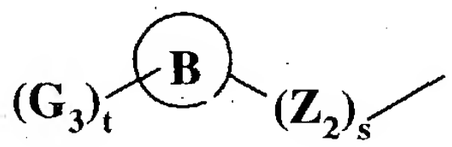
7- The compound according to claim 6, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein R_1 represents a group of formula (i/b):



(i/b)

wherein Z_2 represents a group $-CR_9R_{10}$ in which R_9 and R_{10} represents each a hydrogen atom, s is equal to one, and B, G_3, and t are as defined in the compound of formula (I).

8- The compound according to claim 7, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein R_1 represents a group of formula (i/b):



(i/b)

wherein B represents a phenyl group, t is equal to 0 or 1, and G_3, when it is present, represents a group selected from OR_{11}, halogen, and $(CH_2)_kC(=O)OR_{11}$ in which R_{11} represents an hydrogen atom or a $(C_1\text{-}C_6)$alkyl group and k is equal to zero.

9- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein X_1, X_2, and X_3 represent each a group $-CR_3$ in which R_3 represents a hydrogen atom.

10- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein X_1 represents a group $-CR_3$ in which R_3 represents a hydrogen atom, X_2 represents a nitrogen atom or a group $-CR_3$ in which R_3 represents a hydrogen atom, and X_3 represents a group $-CR_3$ in which R_3 represents a hydrogen atom.

11- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein Z_1 represents $-CR_4R_5$ in which R_4 and R_5 represent each a hydrogen atom, and n is equal to one.

12- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein A represents a phenyl group, m is equal to zero or one, and R_2 represents a $(C_1\text{-}C_6)$alkoxy group or a hydrogen atom.

13- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein A represents a pyridyl group, m is equal to zero or one, and R_2 represents a (C_1-C_6)alkoxy group or a hydrogen atom.

14- The compound according to claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof, wherein A represents an imidazolyl group.

15- The compound according to claim 1 selected from:

- 3-benzyl-2,4-dioxo-3,4-dihydro-2*H*-benzo[*e*][1,3]thiazine-6-carboxylic acid 4-methoxy benzylamide;
- 3-(4-methoxybenzyl)2,4-dioxo-3,4-dihydro-2*H*-benzo[*e*][1,3]oxazine-6-carboxylic acid 4-methoxybenzylamide;
- and 4-[2,4-dioxo-6-(3-phenyl-prop-1-ynyl)-4*H*-1,3-benzothiazin-3-ylmethyl]-benzoic acid; or

a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof.

16- A method for treating a patient afflicted with a disease or disorder that is mediated by a MMP-13 enzyme, comprising administering to the patient an effective amount of a compound of claim 1, or a racemic form, isomer, N-oxide, or pharmaceutically acceptable salt thereof.

17- The method according to Claim 16, wherein the disease or disorder is selected from arthritis, rheumatoid arthritis, osteoarthritis, osteoporosis, periodontal diseases, inflammatory bowel disease, psoriasis, multiple sclerosis, cardiac insufficiency, atherosclerosis, asthma, chronic obstructive pulmonary disease, age-related macular degeneration, and cancer.

18- The method according to Claim 17, wherein the disease or disorder is arthritis.

19- The method according to Claim 18, wherein the disease or disorder is rheumatoid arthritis or osteoarthritis.

20- A pharmaceutical composition comprising as active ingredient an effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable excipient or carrier.

21- The pharmaceutical composition according to Claim 20, wherein the compound as claimed in claim 1 is a compound according to claim 2 or 4.